

Chapter 2 : Linear Systems Systems of Linear Equations

Unit Title: Futurama

Unit Question: Where am I Going?

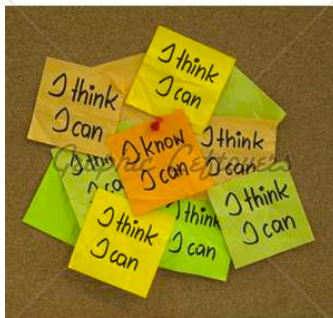
Learner Profile: Reflective

Area of Interaction:
Health & Social Education



I Can Statement:

I can solve a system of linear equations.



Vocabulary

System of Linear Equations:
a set of 2 (or more) linear equations.

Costs

Revenue: (income)

Think, Pair, Share

You want to start your own company.

What kind of company would you create?

What costs would there be to set up your company?

How would you make money(revenue) from this company?

Be ready to share with the class.

ACTIVITY 1: Writing a System of Linear Equations

Work with a partner.

Your family starts a bed-and-breakfast in your home. You spend \$500 fixing up a bedroom to rent. Your cost for food and utilities is \$10 per night. Your family charges \$60 per night to rent the bedroom.

- a. Write an equation that represents your costs.**
- b. Write an equation that represents your revenue (income).**
- c. A set of two (or more) linear equations is called a **system of linear equations**. Write the system of linear equations for this problem.**

Answers to Activity 1: Writing a System of Linear Equations

a. $C = 10x + 500$

b. $R = 60x$

c. $C = 10x + 500$
 $R = 60x$

What does C represent?

What does x represent?

What does R represent?

ACTIVITY 2: Using a Table to Solve a System

Use the cost and revenue equations from Activity 1 to find how many nights you need to rent the bedroom before you recover the cost of fixing up the bedroom. This is the *break-even point* for your business.

a. Complete the table.

X	0	1	2	3	4	5	6	7	8	9	10	11
C	500	510	520	530	540	550	560	570	580	590	600	610
R	0	60	120	180	240	300	360	420	480	540	600	660

$$R = 60X$$

b. How many nights do you need to rent the bedroom before you break even?

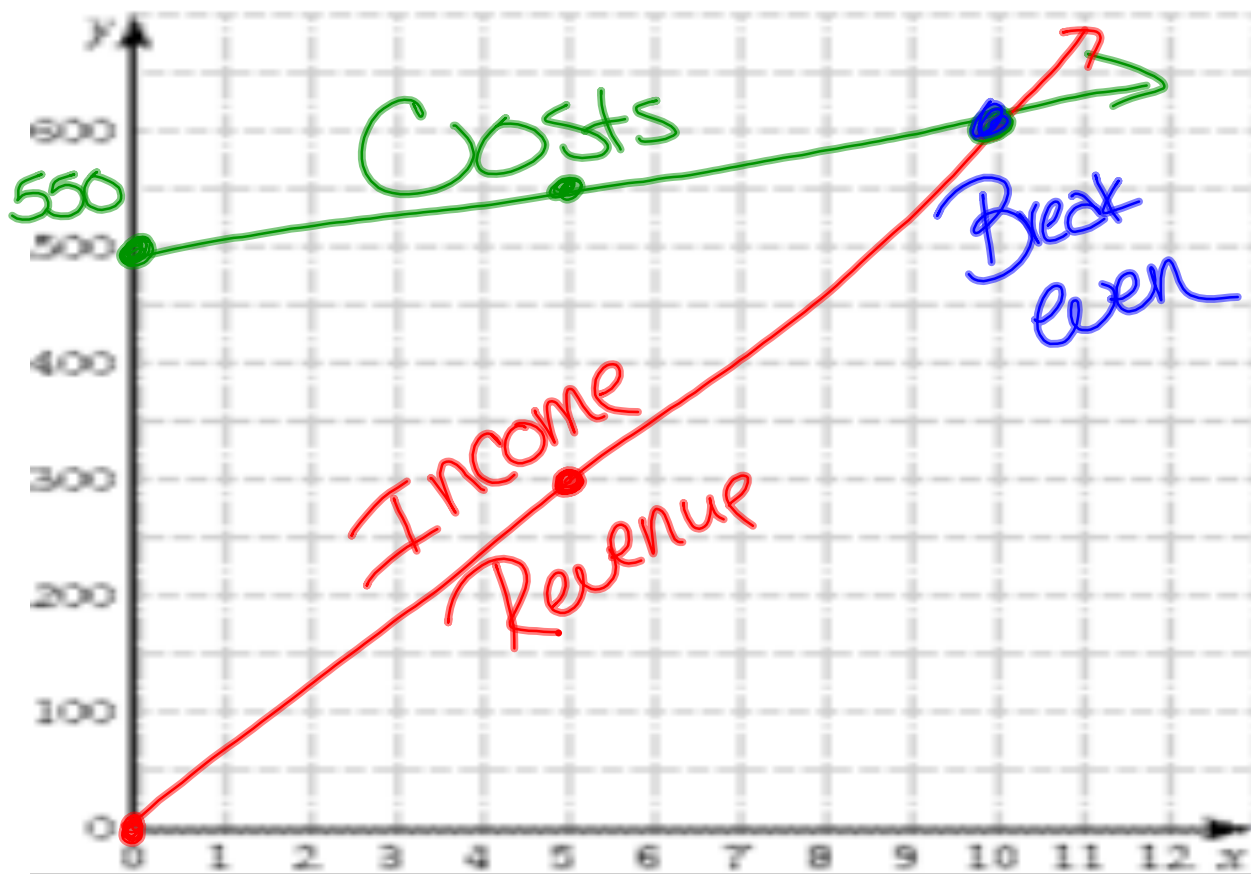
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ACTIVITY 3: Using a Graph to Solve a System

a. Graph the cost equation from Activity 1.

b. In the same coordinate plane, graph the revenue equation from Activity 1.

c. Find the point of intersection of the two graphs. The x -value of this point is the number of nights you need to rent the bedroom to break even.



Activity 4: Using an Equation to Solve a System

a. Write the cost equation from Activity 1.

$C =$ _____

b. Write the revenue equation from Activity 1.

$R =$ _____

c. The break-even point occurs when $C = R$.

Set the expression for C equal to the expression for R .

You should obtain an equation with x on both sides.

Solve this equation for x .

The solution is your break-even point.

d. Did you obtain the same break-even point in Activities 2, 3, and 4?

If not, check your work.

The break-even point should be the same in all three activities.

What Is Your Answer?

5. IN YOUR OWN WORDS How can you solve a system of linear equations?

6. When solving a system of linear equations, explain why it is a good idea to use two different ways to find the solution.

Assignment:

Pages 80-81

#3-8, 19-22

Due tomorrow at the beginning
of class.